

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in The United Kingdom on 8/21/2003.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: (78) and (#507). Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: (20'), mentioned in the specifications on page 31, line 4. Corrected drawing

sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

4. The disclosure is objected to because of the following informalities:

Page 21, lines 23-25 state reference numeral (80) is shown in Figure 6. In fact, it is shown in Figure 7.

Page 21, lines 29-30 refer to element 84 alternately as a "gear" and as a "roller". The Examiner recommends that only one common term be used.

Page 22, line 6 states reference numeral (80) is shown in Figure 6. In fact, it is shown in Figure 7.

Appropriate correction is required.

Claim Objections

5. Claim 25 is objected to because of the following informalities: insert "images" after the word "textural". Appropriate correction is required.

6. Claim 27 is objected to because of the following informalities: change "axis or rotation" to "axis of rotation". Appropriate correction is required.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claim 17 recites the limitation "said centre of rotation". There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

11. Claims 1-2, 4, 15-18, and 34-35 are rejected under 35 U.S.C. 102(e) as being anticipated by Roelofs (US 2002/0154113 A1).

Regarding **claim 1**, Roelofs discloses a photographic apparatus for taking images of an object for use in generating a three dimensional model of the object, the photographic apparatus comprising an object placing unit for placing the object (Figure 1, element 108); an image capturing unit for capturing images of the object for use in generating the three dimensional model (Figure 1, element 102); and an illumination unit (Figure 1, element 104), the image capturing unit and the illumination unit being connectedly moveable relative to the object placing unit such that, in use, the object may be placed by the placing unit both in the field of view of the image capturing unit and in a position where the illumination unit is capable of providing illumination for the image capturing device to take silhouette images of the object (Figure 1; paragraphs 4 and 26).

Regarding **claim 2**, Roelofs discloses all of the limitations as applied to claim 1 above.

Further, Roelofs discloses wherein the image capturing unit and the illumination unit are arranged to be rotatably moved about an axis of rotation such that, whatever angle the image capturing unit is at relative to the object, the object is positioned so that the illumination unit is capable of illuminating a side of the object opposite to a side thereof facing the image capturing device. Figure 1; paragraph 26).

Regarding **claim 4**, Roelofs discloses all of the limitations as applied to claim 1 above.

Further Roelofs discloses wherein the placing unit includes a rotatable turntable to enable the image capturing unit to be used to take images of the object at two or more different orientations (paragraph 4; Figure 1).

Regarding **claim 15**, Roelofs discloses a method of generating a three dimensional model of an object, the method comprising the steps of placing the object using a placing unit such that the object is in the field of view of an image capturing unit capturing an image of the object, wherein the image capturing unit and an illumination unit are connectedly movable relative to the placed object (paragraph 26; Figure 1); taking a plurality of silhouette images of the object using the image capturing unit, with the illumination unit providing illumination for the image capturing device to take the silhouette images of the object (paragraph 4; Figure 2); and using the plurality of images to generate a three dimensional model of the object (paragraph 4; Figure 3).

Regarding **claim 16**, Roelofs discloses all of the limitations as applied to claim 15 above.

Further, Roelofs discloses wherein the image capturing unit and the illumination unit are rotatably mounted about an axis of rotation such that, whatever angle the image capturing unit is at relative to the object, the object is positioned between the image capturing unit and the illumination unit (paragraph 26; Figure 1).

Regarding **claim 17**, Roelofs discloses all of the limitations as applied to claim 16 above.

Further, Roelofs discloses wherein the centre of rotation is closely located above a table on which the object is placed (Figure 1).

Regarding **claim 18**, Roelofs discloses all of the limitations as applied to claim 15 above.

Further, Roelofs discloses wherein the placing unit includes a turntable and is rotatable to enable the image capturing unit to be used to take images of the object at two or more different orientations (paragraph 26; Figure 1).

Regarding **claim 34**, Roelofs discloses all of the limitations as applied to claim 1 above.

Further, Roelofs discloses the system further comprising control means for obtaining image data and means for generating a three dimensional model from said images (Figure 1, elements 110 and 112; paragraph 25).

Regarding **claim 35**, Roelofs discloses all of the limitations as applied to claim 34 above.

Further, Roelofs discloses wherein said control means includes a graphical user interface, a display for displaying information for an operator, and input means to enable an operator to communicate with the system (Figure 1, elements 116 and 118; paragraphs 25 and 32).

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 3, and 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roelofs (US 2002/0154113 A1) in view of Mueller et al (US 2003/0066949 A1).

Regarding **claim 3**, Roelofs discloses all of the limitations as applied to claim 2 above.

Further, Roelofs discloses a table on which the object is placed, and wherein said axis of rotation is closely located above the table (Figure 1).

Roelofs does not disclose wherein said table is transparent.

Mueller et al disclose wherein said table is transparent (paragraph 54).

At the time of the invention, it would have been obvious to a person having ordinary skill in the art to combine Mueller et al with Roelofs. The motivation would have been that a transparent table is less likely to interfere with the imaging process for both silhouette and textural images.

Therefore, it would have been obvious to combine Mueller et al with Roelofs to obtain the invention as disclosed in claim 3.

Regarding **claim 22**, Roelofs discloses all of the limitations as applied to claim 15 above.

Roelofs does not disclose a step of performing a calibration subroutine to generate calibration data prior to the step of placing said object, wherein said calibration subroutine comprises the steps of placing a calibration pattern in the field of view of the image capturing unit; and taking a plurality of images of the calibration pattern using the image capturing unit.

Mueller et al discloses a step of performing a calibration subroutine to generate calibration data prior to the step of placing said object, wherein said calibration subroutine comprises the steps of placing a calibration pattern in the field of view of the image capturing unit (paragraph 137); and taking a plurality of images of the calibration pattern using the image capturing unit (paragraph 142).

At the time of the invention, it would have been obvious to a person having ordinary skill in the art to combine Mueller et al with Roelofs. The motivation would have been to increase the precision with which the resulting images would be taken.

Therefore, it would have been obvious to combine Mueller et al with Roelofs to obtain the invention as disclosed in claim 22.

Regarding **claim 23**, Roelofs in combination with Mueller et al disclose all of the limitations as applied to claim 22 above.

Further, Mueller et al disclose wherein the images of the calibration pattern are taken from every orientation at which said silhouette images are to be taken of an object to be modeled (paragraph 137).

14. Claims 5 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roelofs (US 2002/0154113 A1) in view of Lortz et al (Digital Still Cameras, August 2002, Vol. 8 Issue 8, pp 19-25).

Regarding **claim 5**, Roelofs discloses all of the limitations as applied to claim 1 above.

Further, Roelofs discloses wherein the image capturing unit is used to take both silhouette and textural images of the object (paragraphs 4 and 10).

Roelofs does not disclose wherein the illumination unit provides different illumination when textural images are taken from when the silhouette images are taken.

At the time of the invention, it would have been obvious to a person having ordinary skill in the art of photography to vary the illumination according to the type of image being taken. This is demonstrated by Lortz et al; "By using your camera's compensation controls and underexposing, you can silhouette foreground objects..." The motivation to do so would have been to obtain a sharper silhouette when taking silhouette images and obtaining more detailed features when taking textural images.

Therefore, it would have been obvious to combine Lortz et al with Roelofs to obtain the invention as disclosed in claim 5.

Regarding **claim 14**, Roelofs discloses all of the limitations as applied to claim 1 above.

Roelofs does not disclose wherein in use, an exposure parameter of said image capturing unit is set such that the resulting image is underexposed when said image capturing unit is capturing silhouette data.

Lortz et al disclose wherein in use, an exposure parameter of said image capturing unit is set such that the resulting image is underexposed when said image capturing unit is capturing silhouette data ("By using your camera's compensation controls and underexposing, you can silhouette foreground objects...").

At the time of the invention, it would have been obvious to a person having ordinary skill in the art to combine Lortz et al with Roelofs. The motivation would have been to provide sharper silhouette images.

Therefore, it would have been obvious to combine Lortz et al with Roelofs to obtain the invention as disclosed in claim 14.

15. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Roelofs (US 2002/0154113 A1) in view of Lortz et al (Digital Still Cameras, August 2002, Vol. 8 Issue 8, pp 19-25) and in further view of Petrov et al (US 2002/0050988 A1).

Regarding **claim 6**, Roelofs in combination with Lortz et al disclose all of the limitations as applied to claim 5 above.

Roelofs in combination with Lortz et al do not disclose wherein the image capturing unit takes two or more silhouette images of the object at different orientations in a first period and two or more textural images of the object at different orientations in a second period, the first and second periods being non-overlapping.

Petrov et al disclose wherein the image capturing unit takes two or more silhouette images of the object at different orientations in a first period and two or more textural images of the object at different orientations in a second period, the first and second periods being non-overlapping (paragraphs 19-21).

At the time of the invention, it would have been obvious to a person having ordinary skill in the art to combine Petrov et al with Roelofs and Lortz et al. The motivation for doing so would have been to avoid having to alternate illumination situations for successive images.

Therefore, it would have been obvious to combine Petrov et al with Roelofs and Lortz et al to obtain the invention as disclosed in claim 6.

16. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Roelofs (2002/0154113 A1) in view of Lortz et al (Digital Still Cameras, August 2002, Vol. 8 Issue 8, pp 19-25) and in further view of Mueller et al (US 2003/0066949 A1).

Regarding **claim 7**, Roelofs in combination with Lortz et al disclose all of the limitations as applied to claim 5 above.

Roelofs in combination with Lortz et al do not disclose another illumination unit attached to said image capturing unit for providing illumination for the image capturing device to take textural images.

Mueller et al disclose another illumination unit attached to said image capturing unit for providing illumination for the image capturing device to take textural images (paragraph 169).

At the time of the invention, it would have been obvious to a person having ordinary skill in the art to combine Mueller et al with Roelofs and Lortz et al. The motivation would have been to avoid having to maneuver and alter the illuminating unit for purposes of taking textural images after having taken silhouette images.

Therefore, it would have been obvious to combine Mueller et al with Roelofs and Lortz et al to obtain the invention as applied in claim 7.

17. Claims 8-10, 19-21, 27-30, 32-33, 39-41, and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roelofs (US 2002/0154113 A1) in view of Ogawa (4,372,659).

Regarding **claim 8**, Roelofs discloses all of the limitations as applied to claim 1 above.

Roelofs does not disclose wherein the image capturing unit includes an image capturing device and an optical device, and the optical device deflects an optical axis extending from the object to the image capturing device.

Ogawa discloses wherein the image capturing unit includes an image capturing device and an optical device, and the optical device deflects an optical axis extending from the object to the image capturing device (Figures 1-2).

At the time of the invention, it would have been obvious to a person having ordinary skill in the art to combine Ogawa with Roelofs. The motivation would have been to reduce the size of the overall apparatus.

Therefore, it would have been obvious to combine Ogawa with Roelofs to obtain the invention as disclosed in claim 8.

Regarding **claim 9**, Roelofs in combination with Ogawa disclose all of the limitations as applied to claim 8 above.

Further, Ogawa discloses wherein a relative angle of the optical device and the image capturing device is adjustable in order to move an image of the object towards the centre of an optical view of the image capturing device (column 2, lines 5-7; Figure 2).

Regarding **claim 10**, Roelofs in combination with Ogawa disclose all of the limitations as applied to claim 9 above.

Further, Ogawa discloses wherein the relative angle of the optical device and the image capturing device is dependent on the angle of the image capturing device relative to the object and/or on the size of the object (column 2, lines 5-7; Figure 2).

Regarding **claim 19**, Roelofs discloses all of the limitations as applied to claim 15 above.

Roelofs does not disclose wherein the image capturing unit includes an image capturing device and an optical device, and the optical device deflects an optical axis extending from the object to the image capturing device in said step of taking a plurality of silhouette images.

Ogawa discloses wherein the image capturing unit includes an image capturing device and an optical device, and the optical device deflects an optical axis extending from the object to the image capturing device (Figures 1-2).

At the time of the invention, it would have been obvious to a person having ordinary skill in the art to combine Ogawa with Roelofs. The motivation would have been to reduce the size of the overall apparatus. Further, at the time of the invention, a person having ordinary skill in the art would have recognized the ability of the apparatus disclosed by Ogawa to take silhouette images.

Therefore, it would have been obvious to combine Ogawa with Roelofs to obtain the invention as disclosed in claim 19.

Regarding **claim 20**, Roelofs in combination with Ogawa disclose all of the limitations as applied to claim 19 above.

Further, Ogawa discloses wherein the image capturing device and the optical device are relatively tiltable in order to move an image of the object towards the centre of an optical view of the image capturing device in said step of taking a plurality of silhouette images (column 2, lines 5-7; Figure 2).

Regarding **claim 21**, Roelofs in combination with Ogawa disclose all of the limitations as applied to claim 20 above.

At the time of the invention, it would have been obvious to a person having ordinary skill in the art that, upon inspection of Ogawa (column 2, lines 5-7; Figures 1-2), the magnitude and direction of the tilt would be dependent on the angle of the image capturing device relative to the object and/or the size of the object.

Regarding **claim 27**, Roelofs discloses a photographic apparatus for taking images of an object for use in generating a three dimensional model of the object, the photographic apparatus comprising an object placing unit for placing the object (Figure 1, element 108) and an image capturing unit for capturing images of the object for use in generating the three dimensional model (Figures 1, element 102), the apparatus being arranged such that, in use, the image capturing unit is arranged to be rotatably moved about an axis or rotation such that, whatever angle the image capturing unit is at relative to the object the object may be placed by the object placing unit in the field of view of the image capturing device (Figure 1; paragraphs 4 and 26).

Roelofs does not disclose wherein the image capturing unit includes an image capturing device and an optical device to deflect an optical axis extending from the object to the image capturing device.

Ogawa discloses wherein the image capturing unit includes an image capturing device and an optical device to deflect an optical axis extending from the object to the image capturing device (Figures 1-2).

At the time of the invention, it would have been obvious to a person having ordinary skill in the art to combine Ogawa with Roelofs. The motivation would have been to reduce the size of the overall apparatus.

Therefore, it would have been obvious to combine Ogawa with Roelofs to obtain the invention as disclosed in claim 27.

Regarding **claim 28**, Roelofs in combination with Ogawa disclose all of the limitations as applied to claim 27 above.

Further, Ogawa discloses wherein the optical device deflects the optical axis by around 90 degrees (Figure 1).

Regarding **claim 29**, Roelofs in combination with Ogawa discloses all of the limitations as applied to claim 27 above.

Further, Ogawa discloses wherein a relative angle of the optical device and the image capturing device is adjustable in order to move an image of the object towards the centre of an optical view of the image capturing device (column 2, lines 5-7; Figure 2).

Regarding **claim 30**, Roelofs in combination with Ogawa disclose all of the limitations as applied to claim 29 above.

Further, Ogawa discloses wherein the relative angle of the optical device and the image capturing device is dependent on the angle of the image capturing device relative to the object and/or on the size of the object (column 2, lines 5-7; Figure 2).

Regarding **claim 32**, Roelofs in combination with Ogawa disclose all of the limitations as applied to claim 27 above.

Further, Roelofs discloses an illumination unit being connectedly moveable with the image capturing unit relative to the object placing unit such that, in use, the object may be placed by the placing unit both in the field of view of the image capturing unit and in a position where the illumination unit is capable of providing illumination for the image capturing device to take silhouette images of the object (Figure 1; paragraph 26).

Regarding **claim 33**, Roelofs in combination with Ogawa disclose all of the limitations as applied to claim 27 above.

Further, Roelofs discloses wherein the placing unit includes a rotatable turntable to enable the image capturing unit to be used to take images of the object at two or more different orientations (Figure 1).

Regarding **claim 39**, Roelofs discloses all of the limitations as applied to claim 36 above.

Roelofs does not disclose wherein a photographing position or orientation of the image capturing unit is variable in accordance with the size of the object.

Ogawa discloses wherein a photographing position or orientation of the image capturing unit is variable in accordance with the size of the object (column 2, lines 5-7).

At the time of the invention, it would have been obvious to a person having ordinary skill in the art to combine Ogawa with Roelofs. The motivation would have been to allow for a greater variety of objects to be imaged.

Therefore, it would have been obvious to combine Ogawa with Roelofs to obtain the invention as discloses in claim 39.

Regarding **claim 40**, Roelofs in combination with Ogawa disclose all of the limitations as applied to claim 39 above.

Further, Ogawa discloses wherein the image capturing unit comprises an image capturing device (Figures 1-2, element 14) and an optical device for deflecting an optical axis extending from the object to the image capturing device ((Figures 1-2, element 12), a relative angle of the image capturing device and the optical device is varied in accordance with the size of the object for varying the photographic position or orientation (column 2, lines 5-7).

Regarding **claim 41**, Roelofs in combination with Ogawa disclose all of the limitations as applied to claim 40 above.

Further, Ogawa discloses wherein the relative angle of the optical device and the image capturing device is dependent on the angle of the image capturing device relative to the object and on the size of said object (column 2, lines 5-7; Figures 1-2).

Regarding **claim 44**, Roelofs in combination with Ogawa disclose all of the limitations as applied to claim 27 above.

Further, Roelofs discloses a control means for obtaining image data and means for generating a three dimensional model from said images (paragraph 25).

18. Claims 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roelofs (US 2002/0154113 A1) in view of Petrov et al (US 2002/0050988 A1).

Regarding **claim 24**, Roelofs discloses all of the limitations as applied to claim 15 above.

Roelofs does not disclose a step of taking a plurality of textural images of the object to be modeled from different orientations, wherein said illumination unit provides less illumination for the textural images than for the silhouette images.

Petrov et al discloses a step of taking a plurality of textural images of the object to be modeled from different orientations.

At the time of the invention, it would have been obvious to a person having ordinary skill in the art to combine Petrov et al with Roelofs. The motivation would have been to obtain a more accurate representation of the object being imaged.

Further, at the time of the invention, a person having ordinary skill in the art would have been familiar with the need to provide less illumination for a textural image than for a silhouette image, since more light is needed for a silhouette image to “wash out” the textural details.

Therefore, it would have been obvious to combine Petrov et al with Roelofs to obtain the invention as disclosed in claim 24.

Regarding **claim 25**, Roelofs in combination with Petrov et al disclose all of the limitations as applied in claim 24 above.

Further, Petrov et al disclose wherein a period for said step of taking the silhouette images and a period for said step of taking the textural images are non-overlapping (paragraphs 19-21).

19. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Roelofs (US 2002/0154113 A1) in view of Petrov et al (US 2002/0050988 A1) and in further view of Mueller et al (US 2003/0066949 A1).

Regarding **claim 26**, Roelofs in combination with Petrov et al disclose all of the limitations as applied to claim 24 above.

Roelofs in combination with Petrov et al do not disclose wherein another illumination unit attached to said image capturing unit is provided to provide illumination for the image capturing device to take the textural images of the object.

Mueller et al discloses wherein another illumination unit attached to said image capturing unit is provided to provide illumination for the image capturing device to take the textural images of the object (paragraph 169).

At the time of the invention, it would have been obvious to a person having ordinary skill in the art to combine Mueller et al with Roelofs and Lortz et al. The motivation would have been to avoid having to maneuver and alter the illuminating unit for purposes of taking textural images after having taken silhouette images.

Therefore, it would have been obvious to combine Mueller et al with Roelofs and Lortz et al to obtain the invention as applied in claim 26.

20. Claims 36 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roelofs (US 2002/0154113 A1).

Regarding **claim 36**, Roelofs discloses a photographic apparatus for taking images of an object for use in generating a three dimensional model of the object, the photographic apparatus comprising an object placing unit for placing the object and an image capturing unit for capturing images of the object for use in generating the three dimensional model (Figure 1; paragraph 4).

Roelofs does not specifically disclose an optical focal length of the image capturing unit being variable in accordance with a size of the object placed by the placing unit in the field of view of the image capturing unit. However, at the time of the invention it was very well-known to a person having ordinary skill in the art that focal length is adjusted in accordance with the size of the object being imaged.

Regarding **claim 42**, Roelofs discloses all of the limitations as applied in claim 36 above.

Further, Roelofs discloses the use of a digital camera as said image capturing unit (paragraph 13). At the time of the invention, it would have been obvious to a person having ordinary skill in the art to use a digital camera equipped with a variable zoom and/or focus lens. When using such cameras, a person of ordinary skill would know that it is conventional to calibrate such cameras for each focal length in order to obtain acceptable images for each focal length.

21. Claims 37-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roelofs (US 2002/0154113 A1) in view of Miyamoto et al (US 5,189,458).

Regarding **claim 37**, Roelofs discloses all of the limitations as applied to claim 36 above.

Further, considering that the focal length has been shown to be varied in accordance to the size of the object, it is inherent that the focal length be varied depending on at least one of a width, a depth, and a height of the object.

Roelofs does not disclose that the focal length is manually selectable.

Miyamoto et al disclose that the focal length is manually selectable (column 1, lines 42-48).

At the time of the invention, it would have been obvious to a person having ordinary skill in the art to combine Miyamoto et al with Roelofs. The motivation would have been to give the user more control over the focal length to be selected.

Therefore, it would have been obvious to combine Miyamoto et al with Roelofs to obtain the invention as disclosed in claim 37.

Regarding **claim 38**, Roelofs disclose all of the limitations as applied to claim 36 above.

Roelofs does not disclose a display for showing a user interface through which the optical focal length is selected.

Miyamoto et al disclose a display for showing a user interface through which the optical focal length is selected (column 2, lines 51-59).

At the time of the invention, it would have been obvious to a person having ordinary skill in the art to combine Miyamoto et al with Roelofs. The motivation would have been to provide a means for the user to select the focal length and to provide the user with acknowledgement that said focal length had been entered properly.

Therefore, it would have been obvious to combine Miyamoto et al with Roelofs to obtain the invention as disclosed in claim 38.

Allowable Subject Matter

22. Claims 11-13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Roelofs in combination with Ogawa disclose an illumination unit and an image capturing unit arranged to rotate about an axis of rotation. However, Roelofs does not disclose wherein said illumination unit is mounted between a right illumination arm and a left illumination arm, the image capturing unit being mounted between a right camera arm and a left camera arm, said right illumination arm and said right camera arm meeting at a right arm joint, and said left illumination arm and said left camera arm meeting at a left arm joint.

Claims 31 and 43 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Roelofs in combination with Ogawa disclose an object placing unit including a table on which the object is placed, and also disclose wherein the optical axis is deflected. However, they do not disclose

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that the angle of the deflecting the optical axis is greater in the case that the angle of image capturing device relative to the turntable is smaller.

Conclusion

23. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Yoneyama et al (US 5,570,150) "Stereo photographing system"

Sato (US 4,191,882) "Automatic focus adjusting device"

Callari et al (US 6,415,051 B1) "Generating 3-D models using a manually operated structures light source"

24. Any response to this office action should be faxed to (571) 273-8300 or mailed to:

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Hand - delivered responses should be brought to:

Customer Service Window
Randolph Building
401 Dulany Street

25. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL A. STRIEB whose telephone number is (571)270-3528. The examiner can normally be reached on Monday-Friday 8am-5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benny Tieu can be reached on (571) 272-7490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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MAS

/Benny Q Tieu/
Supervisory Patent Examiner, Art Unit 4177